Journal of MOLECULAR BIOLOGY

EDITOR-IN-CHIEF
J. C. KENDREW

ASSISTANT EDITOR
S. BRENNER

EDITORIAL BOARD
M. S. Bretscher
C. R. Cantor
P. Chambon
M. Gellert
G. A. Gilbert
M. Gottesman
R. Huber
H. E. Huxley
A. Klug
V. Luzzati
M. F. Moody
P. M. B. Walker
S. M. Weissman

VOLUME 137
15 February to 15 March 1980

ACADEMIC PRESS
London New York San Francisco

QH301

Copyright © 1980, by Academic Press Inc. (London) Ltd.

ALL RIGHTS RESERVED

No part of this volume may be reproduced in any form, by photostat, microfilm, or any other means, without written permission from the publishers.

Printed in Great Britain

CONTENTS OF VOLUME 137

NUMBER 1, 15 FEBRUARY 1980

STEWART, M., BEVERIDGE, T. J. and MURRAY, R. G. E., Structure of the Regular Surface Layer of *Spirillum putridiconchylium* 1

COHEN, F. E. and STERNBERG, M. J. E., On the Use of Chemically Derived Distance Constraints in the Prediction of Protein Structure with Myoglobin as an Example 9

KITCHINGMAN, G. R. and WESTPHAL, H., The Structure of Adenovirus 2 Early Nuclear and Cytoplasmic RNAs 23

BLACKWELL, J. and WEIH, M. A., Structure of Chitin–Protein Complexes: Ovipositor of the Ichneumon Fly *Megarhyssa* 49

CREIGHTON, T. E., Kinetic Study of Protein Unfolding and Refolding using Urea Gradient Electrophoresis 61

POTEETE, A. R., PTASHNE, M., BALLIVET, M. and EISEN, H., Operator Sequences of Bacteriophages P22 and 21 81

SERDYUK, I. N., GOGIA, Z. V., VENYAMINOV, S. Y., KNECHINASHVILI, N. N., BUSHUEV, V. N. and SPIRIN, A. S., Compact Globular Conformation of Protein S4 from *Escherichia coli* Ribosomes 93

SERDYUK, I. N., SHPUNGIN, J. L. and ZACCAI, G., Neutron Scattering Study of the 13 S Fragment of 16 S RNA and its Complex with Ribosomal Protein S4 109

ERRATA 123

NUMBER 2, 25 FEBRUARY 1980

SIDDIG, M. A. M., KINSEY, J. A., FINCHAM, J. R. S. and KEIGHREN, M., Frameshift Mutations affecting the N-terminal Sequence of *Neurospora* NADP-specific Glutamate Dehydrogenase 125

ISHIHAMA, A., SHIMAMOTO, N., AIBA, H., KAWAKAMI, K., NASHIMOTO, H., TSUGAWA, A. and UCHIDA, H., Temperature-sensitive Mutations in the α Subunit Gene of *Escherichia coli* RNA Polymerase 137

LINDQUIST, S., Translational Efficiency of Heat-induced Messages in *Drosophila melanogaster* Cells 151

CROWTHER, R. A., Mutants of Bacteriophage T4 that Produce Infective Fibreless Particles 159

Boyd, J., Williamson, F. B. and Gettins, P., A Physico-chemical Study of Heparin: Evidence for a Calcium-induced Co-operative Conformational Transition 175

Fukada, K., Otsuka, A. and Abelson, J., A Restriction Map of the T4 Transfer RNA Gene Cluster 191

Fukada, K., Gossens, L. and Abelson, J., The Cloning of a T4 Transfer RNA Gene Cluster 213

Velten, J. and Abelson, J., The Generation and Analysis of Clones Containing Bacteriophage T4 DNA Fragments 235

Number 3, 5 March 1980

Hauser, H., Pascher, I. and Sundell, S., Conformation of Phospholipids: Crystal Structure of a Lysophosphatidylcholine Analogue 249

Hauser, H., Guyer, W., Spiess, M., Pascher, I. and Sundell, S., The Polar Group Conformation of a Lysophosphatidylcholine Analogue in Solution: A High-resolution Nuclear Magnetic Resonance Study 265

Appendix 280

Baas, P. D., Teertstra, W. R., van der Ende, A. and Jansz, H. S., Bacteriophage ϕX174 and G4 RF DNA Replicative Intermediates: A Comparative Study Using Different Isolation Procedures 283

Rinke, J., Meinke, M., Brimacombe, R., Fink, G., Rommel, W. and Fasold, H., The Use of Azidoarylimidoesters in RNA–Protein Cross-linking Studies with *Escherichia coli* Ribosomes 301

Yeager, M., Schoenborn, B., Engelman, D., Moore, P. and Stryer, L., Neutron Diffraction Analysis of the Structure of Rod Photoreceptor Membranes in Intact Retinas 315

Number 4, 25 March 1980

Beckingham, K. and White, R., The Ribosomal DNA of *Calliphora erythrocephala*; an Analysis of Hybrid Plasmids Containing Ribosomal DNA . 349

DeRosier, D., Tilney, L. and Flicker, P., A Change in the Twist of the Actin-containing Filaments Occurs during the Extension of the Acrosomal Process in *Limulus* Sperm 375

Nowotny, V. and Nierhaus, K. H., Protein L20 from the Large Subunit of *Escherichia coli* Ribosomes is an Assembly Protein 391

Zetina, C. R. and Goldberg, M. E., Reversible Unfolding of the β_2 Subunit of *Escherichia coli* Tryptophan Synthetase and its Proteolytic Fragments 401

Mornon, J. P., Fridlansky, F., Bally, R. and Milgrom, E., X-ray Crystallographic Analysis of a Progesterone-binding Protein. The $C222_1$ Crystal Form of Oxidized Uteroglobin at 2·2 Å Resolution 415

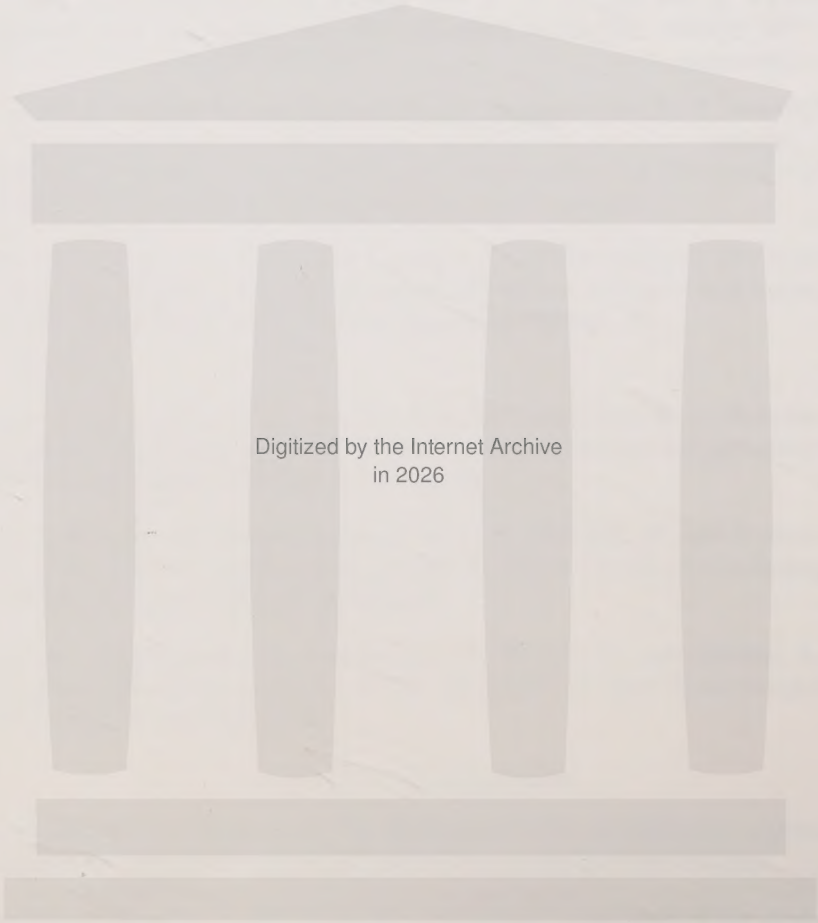
Appendix: Isolation of a new crystalline form: form VI 428

Letters to the Editor

Creighton, T. E. and Pain, R. H., Unfolding and Refolding of *Staphylococcus aureus* Penicillinase by Urea-gradient Electrophoresis . . 431

Aizawa, S. and Maéda, Y., A New Method for Determination of Parity in Optical Diffraction Patterns from the Structures with Helical Symmetry 437

Wellems, T. E. and Josephs, R., Helical Crystals of Sickle Cell Hemoglobin 443



Digitized by the Internet Archive
in 2026

https://archive.org/details/journal-of-molecular-biology_february-15-march-15-1980_137_contents

Volume 137

Abelson, J. (see also Fukada, K.), 191, 213
—, — (see also Velten, J.), 235
Acrosomal process in *Limulus* sperm, a change in the twist of the actin-containing filaments occurs during the extension, 375
Actin-containing filaments, a change in the twist occurs during the extension of the acrosomal process in *Limulus* sperm, 375
Adenovirus 2, structure of early nuclear and cytoplasmic RNAs, 23
Aiba, H. (see also Ishihama, A.), 137
Aizawa, S. & Maéda, Y., A new method for determination of parity in optical diffraction patterns from the structures with helical symmetry, 437
α subunit gene of *Escherichia coli* RNA polymerase, temperature-sensitive mutations, 137
Assembly protein L20 from the large subunit of *Escherichia coli* ribosomes, 391
Azidoarylimidoesters, use in RNA–protein cross-linking studies with *Escherichia coli* ribosomes, 301

Baas, P. D., Teertstra, W. R., van der Ende, A. & Jansz, H. S., Bacteriophage φX174 and G4 RF DNA replicative intermediates: a comparative study using different isolation procedures, 283
Bacteriophages P22 and 21 operator sequences, 81
Bacteriophage φX174 and G4 RF DNA replicative intermediates, a comparative study using different isolation procedures, 283
— T4 DNA fragments, generation and analysis of clones, 235
— — mutants that produce infective fibreless particles, 159
— — transfer RNA gene cluster, a restriction map, 191
— — transfer RNA gene cluster cloning, 213
Ballivet, M. (see also Poteete, A. R.), 81
Bally, R. (see also Mornon, J. P.), 415
Beckingham, K. & White, R., The ribosomal DNA of *Calliphora erythrocephela*; an analysis of hybrid plasmids containing ribosomal DNA, 349
β_2 subunit of *Escherichia coli* tryptophan synthetase and its proteolytic fragments, reversible unfolding, 401
Beveridge, T. J. (see also Stewart, M.), 1
Blackwell, J. & Weih, M. A., Structure of chitin–protein complexes: ovipositor of the ichneumon fly *Megarhyssa*, 49
Boyd, J., Williamson, F. B. & Gettins, P., A physico-chemical study of heparin: evidence for a calcium-induced co-operative conformational transition, 175
Brimacombe, R. (see also Rinke, J.), 301
Bushuev, V. N. (see also Serdyuk, I. N.), 93

$C222_1$ crystal form of oxidized uteroglobin at 2·2 Å resolution; X-ray crystallographic analysis of a progesterone-binding protein, 415
Calcium-induced co-operative conformational transition in heparin, 175
Calliphora erythrocephala ribosomal DNA: an analysis of hybrid plasmids containing ribosomal DNA, 349.
Chitin-protein complexes, structure: ovipositor of the ichneumon fly *Megarhyssa*, 49
Cloning of a T4 transfer RNA gene cluster, 213
Cohen, F. E. & Sternberg, M. J. E., On the use of chemically derived distance constraints in the prediction of protein structure with myoglobin as an example, 9
Conformation, globular, compact, of protein S4 from *Escherichia coli* ribosomes, 93
— of phospholipids: crystal structure of a lysophosphatidylcholine analogue, 249
—, polar group, of a lysophosphatidylcholine analogue in solution; a high-resolution n.m.r. study, 265
Conformational transition, co-operative, calcium-induced, in heparin, 175
Co-operative conformational transition, calcium-induced, in heparin, 175
Creighton, T. E., Kinetic study of protein unfolding and refolding using urea gradient electrophoresis, 61

—, — & Pain, R. H., Unfolding and refolding of *Staphylococcus aureus* penicillinase by urea-gradient electrophoresis, 431
Crosslinking, RNA–protein, studies with *Escherichia coli* ribosomes, the use of azidoarylimido-esters, 301
Crowther, R. A., Mutants of bacteriophage T4 that produce infective fibreless particles, 159
Cytoplasmic and nuclear RNAs, early, of adenovirus 2, structure, 23

DNA fragments, T4, generation and analysis of clones, 235
— replicative intermediates of bacteriophage ϕX174 and G4, a comparative study using different isolation procedures, 283
—, ribosomal, of *Calliphora erythrocephala*; an analysis of hybrid plasmids containing ribosomal DNA, 349
Derosier, D., Tilney, L. & Flicker, P., A change in the twist of the actin-containing filaments occurs during the extension of the acrosomal process in *Limulus* sperm, 375
Diffraction patterns, optical, from the structures with helical symmetry, a new method for determination of parity, 437
Distance constraints, chemically derived, on their use in the prediction of protein structure with myoglobin as an example, 9
Drosophila melanogaster cells, translational efficiency of heat-induced messages, 151

Early nuclear and cytoplasmic RNAs of adenovirus 2, structure, 23
Eisen, H. (see also Poteete, A. R.), 81
Electrophoresis, urea-gradient, and the unfolding and refolding of *Staphylococcus aureus* penicillinase, 431
—, — —, used in kinetic study of protein unfolding and refolding, 61
Engelman, D. (see also Yeager, M.), 315
Escherichia coli RNA polymerase, temperature-sensitive mutations in the α subunit gene, 137
— — ribosomes, compact globular conformation of protein S4, 93
— — —, protein L20 from the large subunit is an assembly protein, 391
— — —, the use of azidoarylimidoesters in RNA–protein cross-linking studies, 301
— tryptophan synthetase β_2 subunit and its proteolytic fragments, reversible unfolding, 401

Fasold, H. (see also Rinke, J.), 301
Fibreless particles, infective, produced by mutants of bacteriophage T4, 159
Filaments, actin-containing, a change in the twist occurs during the extension of the acrosomal process in *Limulus* sperm, 375
Fincham, J. R. S. (see also Siddig, M. A. M.), 125
Fink, G. (see also Rinke, J.), 301
Flicker, P. (see also Derosier, D.), 375
Form VI: isolation of a new crystalline form, 428
Frameshift mutations affecting the N-terminal sequence of *Neurospora* NADP-specific glutamate dehydrogenase, 125
Fridlansky, F. (see also Mornon, J. P.), 415
Fukada, K., Gossens, L. & Abelson, J., The cloning of a T4 transfer RNA gene cluster, 213
—, —, Otsuka, A. & Abelson, J., A restriction map of the T4 transfer RNA gene cluster, 191

G4 (see also Bacteriophage), 283
Gene, α subunit, of *Escherichia coli* RNA polymerase, temperature-sensitive mutations, 137
— cluster, T4 tRNA, cloning, 213
— —, — —, a restriction map, 191
Gettins, P. (see also Boyd, J.), 175
Globular conformation, compact, of protein S4 from *Escherichia coli* ribosomes, 93
Glutamate dehydrogenase, NADP-specific, *Neurospora*, frameshift mutations affecting the N-terminal sequence, 125
Gogia, Z. V. (see also Serdyuk, I. N.), 93
Goldberg, M. E. (see also Zetina, C. R.), 401
Gossens, L. (see also Fukada, K.), 213
Guyer, W. (see also Hauser, H.), 265

Hauser, H., Guyer, W., Spiess, M., Pascher, I. & Sundell, S., The polar group conformation of a lysophosphatidylcholine analogue in solution: a high-resolution nuclear magnetic resonance study, 265

Hauser, H., Pascher, I. & Sundell, S., Conformation of phospholipids: crystal structure of a lysophosphatidylcholine analogue, 249
Heat-induced messages in *Drosophila melanogaster* cells, translational efficiency, 151
Helical crystals of sickle cell hemoglobin, 443
— symmetry structures, a new method for determination of parity in optical diffraction patterns, 437
Hemoglobin, sickle cell, helical crystals, 443
Heparin, a physico-chemical study: evidence for a calcium-induced co-operative conformational transition, 175
Hybrid plasmids containing ribosomal DNA: the ribosomal DNA of *Calliphora erythrocephala*, 349

Ichneumon fly (*Megarhyssa*) ovipositor; structure of chitin–protein complexes, 49
Ishihama, A., Shimamoto, N., Aiba, H., Kawakami, K., Nashimoto, H., Tsugawa, A. & Uchida, H., Temperature-sensitive mutations in the α subunit gene of *Escherichia coli* RNA polymerase, 137

Jansz, H. S. (see also Baas, P. D.), 283
Josephs, R. (see also Wellems, T. E.), 443

Kawakami, K. (see also Ishihama, A.), 137
Keighren, M. (see also Siddig, M. A. M.), 125
Kinetic study of protein unfolding and refolding using urea gradient electrophoresis, 61
Kinsey, J. A. (see also Siddig, M. A. M.), 125
Kitchingman, G. R. & Westphal, H., The structure of adenovirus 2 early nuclear and cytoplasmic RNAs, 23
Knechinashvili, N. N. (see also Serdyuk, I. N.), 93

L20 protein from the large subunit of *Escherichia coli* ribosomes is an assembly protein, 391
Limulus sperm, a change in the twist of the actin-containing filaments occurs during the extension of the acrosomal process, 375
Lindquist, S., Translational efficiency of heat-induced messages in *Drosphila melanogaster* cells, 151
Liver mitochondrial protonic electrochemical potential difference and the thyroid gland: a novel hormone action?, 1
Lysophosphatidylcholine analogue crystal structure; conformation of phospholipids, 249
— — in solution, the polar group conformation; a high-resolution n.m.r. study, 265

Maéda, Y. (see also Aizawa, S.), 437
Megarhyssa (ichneumon fly) ovipositor; structure of chitin–protein complexes, 49
Meinke, M. (see also Rinke, J.), 301
Messages, heat-induced, in *Drosophila melanogaster* cells, translational efficiency, 151
Milgrom, E. (see also Mornon, J. P.), 415
Moore, P. (see also Yeager, M.), 315
Mornon, J. P., Fridlansky, F., Bally, R. & Milgrom, E., X-ray crystallographic analysis of a progesterone-binding protein. The $C222_1$ crystal form of oxidized uteroglobin at 2·2 Å resolution, 415
Murray, R. G. E. (see also Stewart, M.), 1
Mutants of bacteriophage T4 that produce infective fibreless particles, 159
Mutations, frameshift, affecting the N-terminal sequence of *Neurospora* NADP-specific glutamate dehydrogenase, 125
—, temperature-sensitive, in the α subunit gene of *Escherichia coli* RNA polymerase, 137
Myoglobin as an example of the use of chemically derived distance constraints in the prediction of protein structure, 9

NADP-specific glutamate dehydrogenase, *Neurospora*, frameshift mutations affecting the N-terminal sequence, 125
Nashimoto, H. (see also Ishihama, A.), 137
Neurospora NADP-specific glutamate dehydrogenase, frameshift mutations affecting the N-terminal sequence, 125

Neutron diffraction analysis of the structure of rod photoreceptor membranes in intact retinas, 315
— scattering study of the 13 S fragment of 16 S RNA and its complex with ribosomal protein S4, 109
Neirhaus, K. H. (see also Nowotny, V.), 391
Nowotny, V. & Nierhaus, K. H., Protein L20 from the large subunit of *Escherichia coli* ribosomes is an assembly protein, 391
N-terminal sequence of *Neurospora* NADP-specific glutamate dehydrogenase, effect of frameshift mutations, 125
Nuclear and cytoplasmic RNAs, early, of adenovirus 2, structure, 23
— magnetic resonance study, high-resolution, of the polar group conformation of a lysophosphatidylcholine analogue in solution, 265

Operator sequences of bacteriophages P22 and 21, 81
Otsuka, A. (see also Fukada, K.), 191
Ovipositor of the ichneumon fly *Megarhyssa*; structure of chitin–protein complexes, 49

P21 (see also Bacteriophage), 81
P22 (see also Bacteriophage), 81
ϕX174 (see also Bacteriophage), 283
Pain, R. H. (see also Creighton, T. E.), 431
Parity determination in optical diffraction patterns from the structures with helical symmetry, a new method, 437
Pascher, I. (see also Hauser, H.), 249, 265
Phospholipid conformation: crystal structure of a lysophosphatidylcholine analogue, 249
Physico-chemical study of heparin: evidence for a calcium-induced co-operative conformational transition, 175
Polar group conformation of a lysophosphatidylcholine analogue in solution; a high-resolution n.m.r. study, 265
Polymerase for *Escherichia coli* RNA, temperature-sensitive mutations in the α subunit gene, 137
Poteete, A. R., Ptashne, M., Ballivet, M. & Eisen, H., Operator sequences of bacteriophages P22 and 21, 81
Progesterone-binding protein, X-ray crystallographic analysis of the $C222_1$ crystal form of ozidized uteroglobin at 2·2 Å resolution, 415
Protein L20 from the large subunit of *Escherichia coli* ribosomes is an assembly protein, 391
— S4 from *Escherichia coli* ribosomes, compact globular conformation, 93
— —, ribosomal, neutron scattering study of its complex with the 13 S fragment of 16 S RNA, 109
— structure prediction using chemically derived distance constraints, with myoglobin as an example, 9
— unfolding and refolding, kinetic study using urea gradient electrophoresis, 61
Proteolytic fragments and β_2 subunit of *Escherichia coli* tryptophan synthetase, reversible unfolding, 401
Ptashne, M. (see also Poteete, A. R.), 81

Refolding and unfolding of protein, kinetic study using urea gradient electrophoresis, 61
— — — — *Staphylococcus aureus* penicillinase by urea-gradient electrophoresis, 431
Replicative intermediates of bacteriophage ϕX174 and G4 during RF DNA replication, a comparative study using different isolation procedures, 283
Restriction map of the T4 transfer RNA gene cluster, 191
Retinas, intact, neutron diffraction analysis of the structure of rod photoreceptor membranes, 315
RNA, nuclear and cytoplasmic, early, of adenovirus 2, structure, 23
— polymerase, *Escherichia coli*, temperature-sensitive mutations in the α subunit gene, 137
— -protein cross-linking studies with *Escherichia coli* ribosomes, the use of azidoarylimidoesters, 301
— 16 S, neutron scattering study of 13 S fragment and its complex with ribosomal protein S4, 109
—, transfer, T4 gene cluster cloning, 213
—, —, — — —, a restriction map, 191
Ribosomal DNA of *Calliphora erythrocephala*; an analysis of hybrid plasmids containing ribosomal DNA, 349
— protein S4, neutron scattering study of its complex with the 13 S fragment of 16 S RNA, 109
Ribosomes of *Escherichia coli*, compact globular conformation of protein S4, 93
— — — —, protein L20 from the large subunit is an assembly protein, 391
— — — —, the use of azidoarylimidoesters in RNA–protein cross-linking studies, 301

Rinke, J., Meinke, M., Brimacombe, R., Fink, G., Rommel, W. & Fasold, H., The use of azidoarylimidoesters in RNA–protein cross-linking studies with *Escherichia coli* ribosomes, 301
Rod photoreceptor membranes in intact retinas, neutron diffraction analysis of structure, 315
Rommel, W. (see also Rinke, J.), 301

S4 protein from *Escherichia coli* ribosomes, compact globular conformation, 93
— —, ribosomal, neutron scattering study of its complex with the 13 S fragment of 16 S RNA, 109
Schoenborn, B. (see also Yeager, M.), 315
Sequence, N-terminal, of *Neurospora* NADP-specific glutamate dehydrogenase, effect of frame-shift mutations, 125
Sequences, operator, of bacteriophages P22 and 21, 81
Serdyuk, I. N., Gogia, Z. V., Venyaminov, S. Y., Knechinashvili, N. N., Bushuev, V. N. & Spirin, A. S., Compact globular conformation of protein S4 from *Escherichia coli* ribosomes, 93
—, —, Shpungin, J. L. & Zaccai, G., Neutron scattering study of the 13 S fragment of 16 S RNA and its complex with ribosomal protein S4, 109
Shimamoto, N. (see also Ishihama, A.), 137
Shpungin, J. L. (see also Serdyuk, I. N.), 109
Sickle cell hemoglobin helical crystals, 443
Siddig, M. A. M., Kinsey, J. A., Fincham, J. R. S. & Keighren, M., Frameshift mutations affecting the N-terminal sequence of *Neurospora* NADP-specific glutamate dehydrogenase, 125
Sperm, *Limulus*, a change in the twist of the actin-containing filaments occurs during the extension of the acrosomal process, 375
Spiess, M. (see also Hauser, H.), 265
Spirillum putridiconchylium, structure of the regular surface layer, 1
Spirin, A. S. (see also Serdyuk, I. N.), 93
Staphylococcus aureus penicillinase, unfolding and refolding by urea-gradient electrophoresis, 431
Sternberg, M. J. E. (see also Cohen, F. E.), 9
Stewart, M., Beveridge, T. J. & Murray, R. G. E., Structure of the regular surface layer of *Spirillum putridiconchylium*, 1
Structure of adenovirus 2 early nuclear and cytoplasmic RNAs, 23
— — chitin–protein complexes: ovipositor of the ichneumon fly *Megarhyssa*, 49
— — a lysophosphatidylcholine analogue; conformation of phospholipids, 249
— —, prediction using chemically derived distance constraints, with myoglobin as an example, 9
— — the regular surface layer of *Spirillum putridiconchylium*, 1
— — rod photoreceptor membranes in intact retinas, neutron diffraction analysis, 315
Structures with helical symmetry, a new method for determination of parity in optical diffraction patterns, 437
Stryer, L. (see also Yeager, M.), 315
Sundell, S. (see also Hauser, H.), 249, 265
Surface layer, regular, of *Spirillum putridiconchylium*, structure by electron microscopy, 1

T4 (see also Bacteriophage), 159, 191, 213, 235
Teertstra, W. R. (see also Baas, P. D.), 283
Temperature-sensitive mutations in the α subunit gene of *Escherichia coli* RNA polymerase, 137
Tilney, L. (see also DeRosier, D.), 375
Transfer RNA T4 gene cluster cloning, 213
— — — — —, a restriction map, 191
Translational efficiency of heat-induced messages in *Drosophila melanogaster* cells, 151
Tryptophan synthetase, *Escherichia coli*, β_2 subunit and its proteolytic fragments, reversible unfolding, 401
Tsugawa, A. (see also Ishihama, A.), 137
Twist change of the actin-containing filaments occurs during the extension of the acrosomal process in *Limulus* sperm, 375

Uchida, H. (see also Ishihama, A.), 137
Unfolding and refolding of protein, kinetic study using urea gradient electrophoresis, 61
— — — — *Staphylococcus aureus* penicillinase by urea-gradient electrophoresis, 431
—, reversible, of the β_2 subunit of *Escherichia coli* tryptophan synthetase and its proteolytic fragments, 401

Urea-gradient electrophoresis and the unfolding and refolding of *Staphylococcus aureus* penicillinase, 431
— — — used in kinetic study of unfolding and refolding of proteins, 61
Uteroglobin, oxidized, the $C222_1$ crystal form at 2.2 Å resolution; X-ray crystallographic analysis of a progesterone-binding protein, 415

van der Ende, A. (see also Baas, P. D.), 283
Velten, J. & Abelson, J., The generation and analysis of clones containing bacteriophage T4 DNA fragments, 235
Venyaminov, S. Y. (see also Serdyuk, I. N.), 93

Weih, M. A. (see also Blackwell, J.), 49
Wellems, T. E. & Josephs, R., Helical crystals of sickle cell hemoglobin, 443
Westphal, H. (see also Kitchingman, G. R.), 23
White, R. (see also Beckingham, K.), 349
Williamson, F. B. (see also Boyd, J.), 175

X-ray crystallographic analysis of a progesterone-binding protein. The $C222_1$ crystal form of oxidized uteroglobin at 2·2 Å resolution, 415

Yeager, M., Schoenborn, B., Engelman, D., Moore, P. & Stryer, L., Neutron diffraction analysis of the structure of rod photoreceptor membranes in intact retinas, 315

Zaccai, G. (see also Serdyuk, I. N.), 109
Zetina, C. R. & Goldberg, M. E., Reversible unfolding of the β_2 subunit of *Escherichia coli* tryptophan synthetase and its proteolytic fragments, 401